

# Education Improvement through ISO 9000 Implementation: Experiences in Taiwan\*

YUN-YAO CHENG

*Department of Accounting, Da-Tung Institute of Technology, Chia-Yi, Taiwan, R.O.C.*

*E-mail: yunyao@sunipc.ttc.edu.tw*

JRJUNG LYU

*Department of Industrial and Information Management, National Cheng Kung University, Tainan, Taiwan, R.O.C.*

YI-CHEN LIN

*Department of Management and Information Technology, Southern Taiwan University of Technology, Tainan, Taiwan, R.O.C.*

*This paper describes the experiences of introducing ISO 9000 into Taiwan's higher education systems. Based on an empirical investigation and a case study, the authors argue that the implementation of ISO 9000 quality systems has a positive impact on the education quality. The benefits of ISO 9000 certification are further depicted for those interested in complying with the Standard. We also justify the current progress of the ISO 9000 implementation in Taiwan with recommendations for improvement.*

## INTRODUCTION

ISO 9000 series standards provide clear guidelines for the top management of an institution or university to improve the effectiveness of their education system [1]. Just like the thousands of organizations who have realized the benefits of international quality standards and embraced them in the drive for competitiveness, there are more and more colleges and universities in the process of seeking ISO 9000 registration in order to improve the educational quality through a better quality management system. As described in a previous paper [2], the ISO 9001 model can be interpreted for application in a university environment. Obtaining ISO 9000 registration is therefore not so difficult for an educational organization.

In Taiwan, National Kao-Hsiung University of Technology was the first institute of technology to earn ISO 9000 certification in April 1998. Since then, Yuan Ze University, Southern Taiwan University of Technology, Kun-Sen University of Technology, and National Cheng Kung University have registered with the ISO 9000 series. At this time, almost all the colleges have or are seeking ISO 9000 certification. That is, ISO 9000 registration is rapidly becoming a common certificate for the institutions or universities in Taiwan. This phenomenon is apparently unique in the world. Today, some of the organizations have also introduced the ISO 14001 environmental management system.

An empirical study was carried out by the authors in order to investigate the reasons behind the popularity of ISO registration in Taiwan [3]. A summary of the findings in that study can be described as follows:

1. *Pressure from growing competition.* During the past few years, the government approved many colleges to upgrade into institutes of technology and the latter into universities of technology. Many managers recognized ISO 9000 registration as a way to assist the educational system transformation and expected that it could also increase administration efficiency.
2. *Me-too strategy.* This widely used strategy pushes many colleges to seek for ISO 9000 registration because the top management of the organizations regard it as the fundamental requirement for survival.
3. *Strong support by the Ministry of Education.* The Ministry of Education encouraged colleges to achieve ISO certification and the organizations could get partial financial support for implementation of ISO 9000 quality management systems based on a special program.
4. *Official evaluation.* The colleges are evaluated by the Ministry of Education once every four years. The results of the official evaluation are important inputs to decide the amount of financial support from the government to each college. Because of this evaluation mechanism, the officials have a great impact on the colleges and can affect their quality policies.

A survey of selected manufacturers in Taiwan indicated that ISO registration had significant

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positive effects on customers' complaints, internal quality defects, and transaction flow [4]. While there is no official investigation into the impact of ISO 9000 implementation on quality performance, observations by the authors are consistent with the argument in [5] which states that the benefits of an ISO 9000 implementation outweigh the potential pitfalls in a university setting. Our survey also learnt that there are some common misunderstandings of ISO 9000, and more discussion about the Standard compliance as well as a case study are presented in the following sections. We also justify the recent progress of the quality certification in Taiwan.

### THE COSTS OF ISO 9000 NON-COMPLIANCE

To achieve ISO 9000 certification, an organization has to be assessed by qualified auditors, who use the Standard to evaluate the system. The ISO 9001:2000 standard which specifies the requirements of quality management systems consists of five major sections and its detailed interpretation can be found in [5]. The basic rule is that an organization can become registered provided the auditors have not found any major non-conformance. To demonstrate that the quality management system either complies or does not comply with the Standard, an auditor is required to find objective evidence in order to justify the observations written in the assessment report. Note that the registration firms, which send the audit team to perform assessment, are required to be accredited by a certain administering body in order to ensure the quality of audit.

As there are only 14 pages in the ISO 9001 Standard and the importance of education quality is well recognized, it might be expected that most of the engineering schools can easily comply with the Standard. On the contrary, schools seldom meet the requirements without serious transformation and many universities or colleges have taken years to get registered. Several of the commonly found non-conformances, which have arisen when quality systems have just started implementation, are listed below for further discussion.

- *Lack of management commitment.* Stated in 5.1 'Top management shall provide evidence of its commitment by . . . (b) establishing the quality policy, (c) ensuring that quality objectives are established . . .' Almost all engineering schools do not have the stated quality policy and quality objectives originally. As a result, different parties in the schools may have conflicting interests and do not focus their efforts to improve engineering education. A mission statement such as 'We are committed to the constant pursuit of excellence in engineering education, research and service to meet society's changing needs and aspirations' [6] would give evidence of the management commitment.

- *Customer is not the focus.* Stated in 5.2 'Top management shall ensure that customer requirements are determined and are met with the aim of enhancing customer satisfaction . . .' When developing the curriculum, for instance, many departments do not put the customer requirements in the first place but are guided by the available facilities and the previous program. Students may learn some techniques that have already been phased out in industry. In many universities, service quality and higher education are not integrated through an effective management system [7].
- *Knowledge is not accumulated.* Stated in 4.2.1 'The quality management system documentation shall include . . . (d) documents needed by the organization to ensure the effective planning, operation and control of its processes . . .' Explicit knowledge that has been written in documents preserves valuable experiences and research insights of the system. Documents such as the manuals in the laboratories, research theses, computer programs and their descriptions, textbook notes, etc. are all critical knowledge for better engineering education. It is common in many engineering schools to find a lack of documentation of the key processes. But once processes are well documented, benchmarks can be defined in order to achieve best practices [8].

Besides the items listed above, other non-conformances include:

1. Not appointing a management representative (ISO 9001 5.6)
2. Pricing is the major factor to select suppliers (ISO 9001 7.4.1)
3. Not performing internal audit but only monitoring the school (ISO 9001 8.2.2)
4. Not performing preventive action but corrective action only (ISO 9001 8.5.3).

These are the partial gaps in an engineering school system that may be found during the ISO 9000 implementation process. A top management can use ISO 9001 to diagnosis the management system.

In summary, the costs of ISO 9000 non-compliance are high which means there is great incentive for improvement. The ISO 9001 standard provides a systematic way for the top management to improve the engineering education evolutionally. It implies that an effective quality system can be established with better management skills. Figure 1 illustrates the transformation stages of an engineering education system. The ISO 9004 standard provides guidelines for performance improvements instead of only compliance, and *education excellence* depicts a management system with delighted customers through an outstanding system, such as the one that earned a national quality award. ISO 9001 certification is apparently an important step to transform from an internal integrated system toward education excellence.

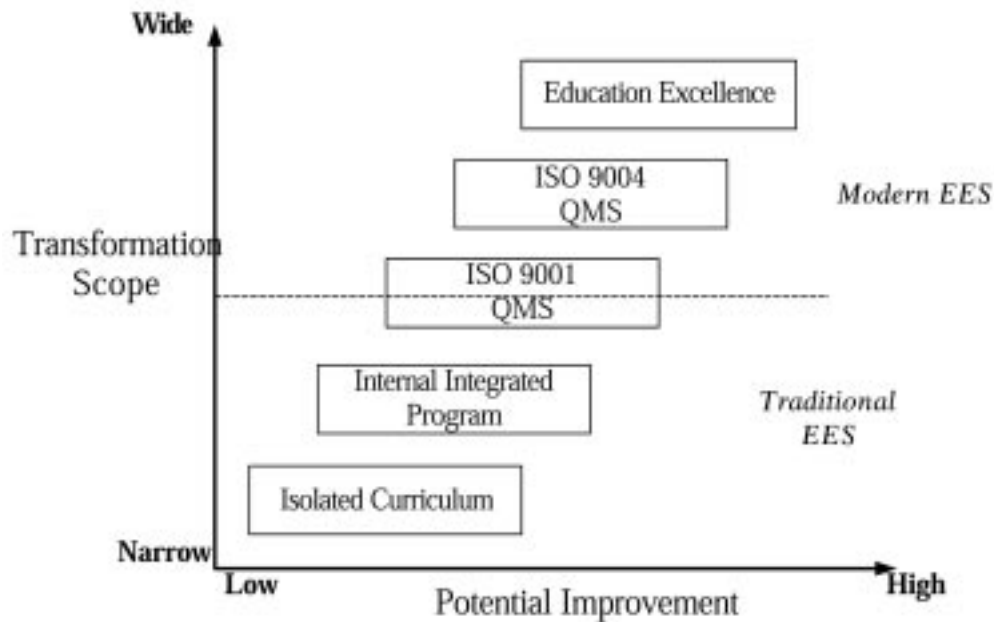


Fig 1. Five-stage framework of the education transformation.

### CASE STUDY

The case university was founded in 1989 as an engineering school. The spirit of the school is to establish a campus culture that integrates technology and humanities, cultivates knowledge and wisdom, unites theory and application, and combines quality and innovation. The evolution of its engineering education is described as follows.

- *Program development.* The case university developed a three-tiered administrative management system which evaluated through planned budget control to build up integral planning systems for administrative development of higher education. It has also pursued rationalized, standardized, and scientific business administration and established an Executive Committee for Standardized Business Administration to plan, promote and evaluate the activities of business administration. Generally speaking, all the administration functions to support teaching and research have been implemented by the strategy, method and tool of Total Quality Management.
- *An integrated school.* Since 1994, its faculty members have engaged in the establishment and supervision of educational programs. The teaching quality assurance system (see Fig. 2) was designed to develop a systematic and integrated education system. The system was fully implemented in the university after a two-year effort and made the case university into an integrated school.
- *ISO 9000 certification.* In 1998, the case university was registered as complying with the ISO 9001 standard. They had implemented the system without the support of outside consultants. The president and the management

representative have been frequently invited to share their experiences since then.

- *Quality award.* A so-called total quality improvement system was designed in this stage. The objective of the system was to improve its performance, especially the customer satisfaction. A one-stop service counter, for example, was set up in 1998 to improve its service level. The case university also intends to implement ISO 14001 standard and OHSAS 18001 standard. In 1999, it earned the 35th Quality Award by the Chinese Society for Quality and its performance was well recognized.
- *Education excellence.* In this stage the case university has striven to contemplate the direction of school development, to bring out new systems and to surpass traditions. It has always claimed to be an experimentalist in higher education. It was presented with the Award of Outstanding College in Cooperative Education by the Chinese Institute of Engineers in 1994 and 1996 and was evaluated as the best University in general education by the Ministry of Education in 2000.

This case university illustrates that with top management commitment, the quality of engineering education can be highly improved. From the establishment of a training quality assurance system to becoming the role model, there is always room for further improvement. The ISO 9001 standard set more than the basic requirements for the case university, it energized its quality loop.

### JUSTIFICATION

The ISO 9001 standard provides an interesting learning environment for many engineering

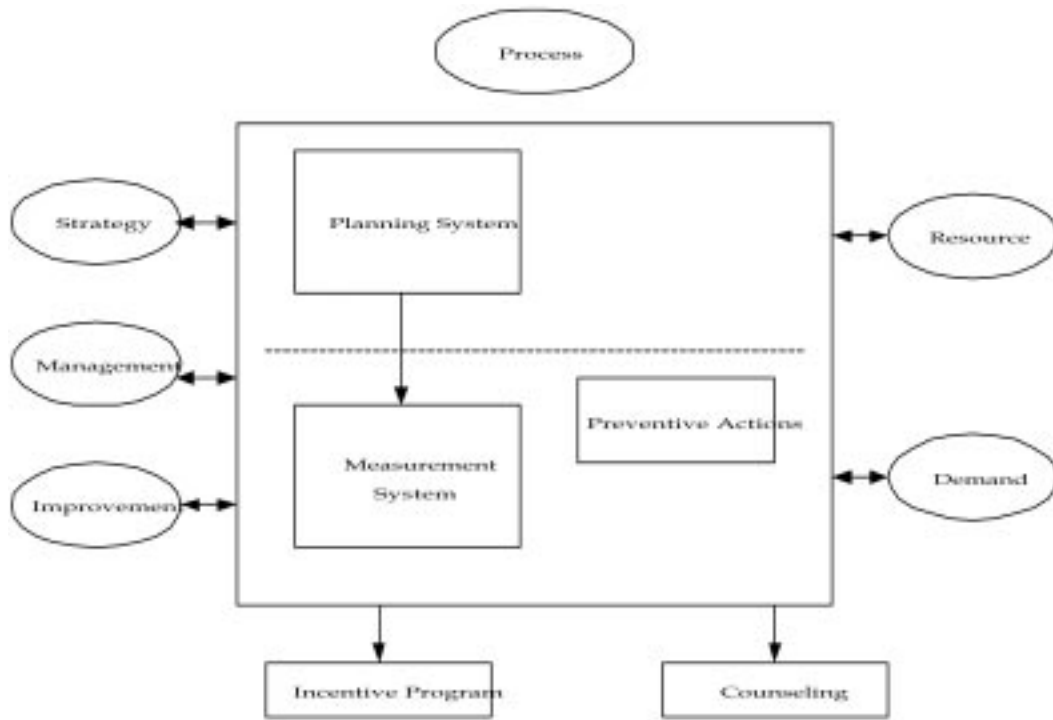


Fig 2. Architecture of the teaching quality assurance system.

schools in Taiwan to transform themselves into customer-focused organizations. It is known that ISO registration is only the beginning of implementing an effective quality system. We have shared some positive experiences in the previous two sections, but there are some downsides, which are discussed in the following.

To make certification easier, many universities and colleges have limited their scope of registration to administrative and academic support, such as personnel office, library, computer center, etc.

While this can reduce the waste of educational resources and improve the quality of the supporting system, the improvement of education quality is therefore not so significant. In transforming the management system from the 1994 version to the 2000 version, we hope more organizations can take this opportunity to broaden the registration scope in order to really meet the needs and expectations of the customers.

Another fact we observe is that virtually none of the universities or colleges have used registration

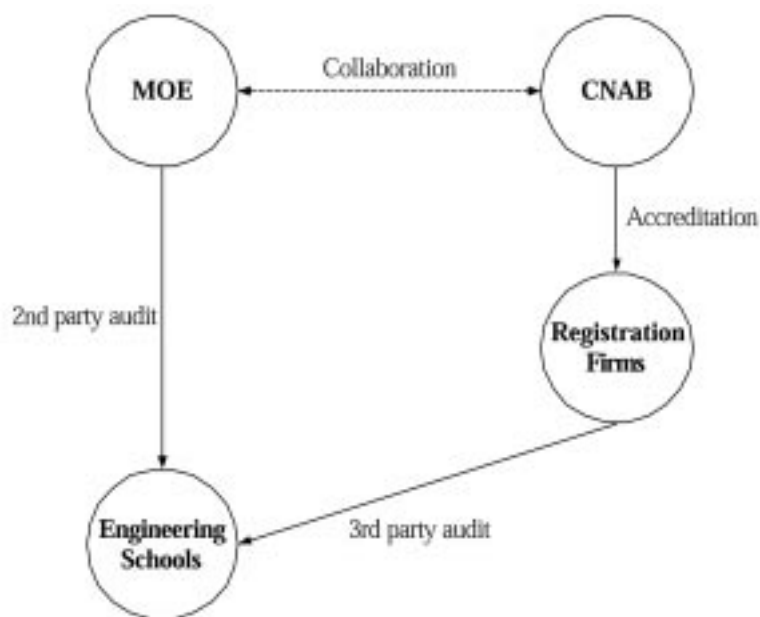


Fig 3. Relationship of MOE, CNAB, and the engineering schools.

firms which have been accredited by the Chinese National Accreditation Board (CNAB), the only accreditation body in Taiwan. The quality of the assessment is therefore doubtful since the auditors are paid by the organizations to do the assessment, and without the supervision of CNAB, the quality of the audit is not assured. Their relationship is shown in Fig. 3. It seems that the time has arrived for the Ministry of Education (MOE) to collaborate with CNAB to ensure the engineering education quality system is improved through a sound infrastructure. We also expect CNAB can take a more aggressive role to promote the concept of accreditation.

Top management commitment is the key to the success of any quality activity. There was a top officer in MOE who thought that ISO 9000 was for manufacturers only and decided to abandon the special program that was encouraging ISO 9000 certification. Though that top officer has now stepped down, his mistake stands. We regret that our national efforts to improve education quality through quality certification has been slowing

down. The need for top management commitment in ISO 9000 implementation is now the consensus.

## CONCLUSION

This paper reports the experiences of ISO 9000 implementation in higher education. We describe the reasons for the popularity of ISO certification and suggest it is very positive for engineering schools to improve their education quality. The benefits of having ISO 9000 compliance are then described and a case study is presented. Justification of the current progress of ISO 9000 registration is provided from a macro view.

A five-stage framework is provided to clarify the role of a ISO 9001 quality management system. The framework suggests the top management of an engineering school can adopt ISO 9001 as the stepping stone toward education excellence. Quality certification is therefore a powerful tool to improve engineering education.

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**Yun-Yao Cheng** is an Instructor and Student Counselor in the Accounting Department at the Ta-Tung Institute of Technology. She obtained her MA degree in Finance from the University of Iowa. She has led students to win the research project contest several times. Her current research interests include investment justification, quality cost, and quality management in education systems.

**Jrjung Lyu** is a professor in the Department of Industrial and Information Management at National Cheng Kung University. He obtained a Ph.D. degree in industrial engineering from the University of Iowa. He has participated in many industrial projects and is an assessor of the Chinese National Accreditation Board. Dr Lyu has published over 30 journal papers and earned the National Quality Award in 2002. He has worked on research projects in the areas of global quality management, six-sigma satisfaction, e-business strategy, and supply chain management currently.

**Yichen Lin** received her Ph.D. degree in Management Systems and Sciences from University of Hull, UK, in 2001. She is an Associate Professor with the Department of Management and Information Technology, Southern Taiwan University of Technology. Her research interests include total quality management, customer relationship management (CRM), and integrated communication. She has participated in many industrial projects, especially in the area of CRM.